Toy Designer: Creating Toys Using Physical Science

Performance Task

Introduction

Toys are designed for children of all ages. Each year new ideas and new toys become available for children encouraging them to have fun and often to learn something about themselves and/or the world around them. You will be working on a toy design team that is responsible for designing a new toy that uses concepts of physical science that is not only fun and exciting, but educational as well.

Big Idea / Essential Questions

Big Idea

- A technological world requires that humans develop capabilities to solve technological challenges and improve products for the way we live.
- Some attributes of objects are measurable.
- Some questions can be answered by collecting, analyzing, and representing data.

Essential Questions

- How would you apply technological design and problem-solving methods in the development of inventions and innovations?
- What strategies can we use to find the attributes of objects?
- How can we use data to solve problems?

G.R.A.S.P.

Goal

You are a toy designer for a toy company. You and your design team are responsible for designing and marketing a new product that will be fun and educational for children.

Role

ou are a senior designer for a toy company. You and your design team are responsible for creating and marketing the newest toy designs for children ages 4 to 6 years old. The company management has asked your team to choose one of the following topics for your toy design.

- Toy to explore forces and motion,
- Toy to discover simple machines, or
- Toy that uses buoyancy to play with in the water.

Audience

Your audience is the management and marketing teams who will be evaluating your ideas. You want to be informative and persuasive so that the management and marketing teams will be convinced to manufacture your new toy. You also have an audience of the target group of children, aged 6-10, who will be playing with your toy.

Situation

As a toy designer who creates and builds toys, you will also need to help develop the advertisement that goes with your toy. Since you want your toy to be successful, creating a fun and exciting toy will be important. Some of the questions you will want to answer during this design process may include:

- What special features do you want to include to excite and meet the needs of your target audience?
- What qualities should be included to encourage the target audience to want to purchase your toy?
- What should you consider for your design based upon safety, cost, material, and the children who will play with this toy?

Products

1. Drawing

Before you create a model of your toy, it is important to do sketches and diagrams to help in your model design. For this product you will want to create a detailed drawing of your toy. This drawing should include labels, measurements, and materials used. You may also want to show your toy from different points of view.

Drawing

Achievement Levels	1	2	3	4
Solution to Design Problem (x1)	The product needs more information to visually describe the toy based on the simple design problem.	The product somewhat visually describes the toy based on the simple design problem.	The product somewhat clearly and visually describes the toy based on the simple design problem.	The product clearly and visually describes the toy based on the simple design problem.
Materials for Making the Toy (x1)	The product includes few of the materials needed to be sure the toy is easy to be built by the toy company.	The product includes some of the materials needed to be sure the toy is easy to be built by the toy company.	The product includes the materials needed to be sure the toy is safe for children and easy to be built by the toy company.	The product includes the materials needed to be very sure the toy is safe for children and easy to to be built by the toy company.

Achievement Levels	1	2	3	4
Forces on an Object (x1)	The toy created does not have balanced and/or unbalanced forces on the motion of an object.	The toy created provides little evidence of the effects of balanced and/or unbalanced forces on the motion of an object.	The toy created provides some evidence of the effects of balanced and/or unbalanced forces on the motion of an object.	The toy created provides strong evidence of the effects of balanced and/or unbalanced forces on the motion of an object.
Motion of the Toy (x1)	The product does not provide a visual observation of the toyâ€™s motion to provide evidence that a pattern can be used to predict future motion.	The product provides a couple of visual observations of the toyâ€™s motion to provide evidence that a pattern can be used to predict future motion.	The product provides some visual observations of the toyâ€™s motion to provide evidence that a pattern can be used to predict future motion.	The product provides strong visual observations of the toyâ€™s motion to provide evidence that a pattern can be used to predict future motion.

2. Model/Prototype

It will be important for you to create a model/prototype of your new toy design. This model will need to work and utilize the physical science principles you and your team decided to use to create the toy. You may choose how you want to make your model. You may use recycled materials such as cardboard, straws, etc. or K'NEX, Legos or other types of model materials that may be available. There are many possibilities! Be sure that you create this model based on the drawing you created to guide this development.

Model/Prototype

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Testing the Model/Prototype (x1)	The product is the result of little testing.	The product is the result of some testing to identify aspects of a model or prototype that can be improved.	The product is the result of tests in which variables are controlled to identify aspects of a model or prototype that can be improved.	The product is the result of fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Model/Prototype

Achievement Levels 0

3. Sales Pitch

You will need to give a 2-3-minute sales pitch that will help persuade the company leaders to manufacture your new toy. In an engaging way, explain how your toy is connected to physical science and how the toy uses these ideas to help make it work. You may want to use your drawing and/or your model to help explain your toy and demonstrate how it works. It will also be important to help them understand why children aged 6-10 will find the toy fun to play with as they learn about physical science.

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Presentation (x1)	The presentation is interesting, but does not contain appropriate facts and descriptive details.	The presentation is interesting with appropriate facts and descriptive details shared but could be presented more clearly and at an understandable pace.	The presentation is interesting with appropriate facts and descriptive details shared while speaking mostly clearly at an understandable pace.	The presentation is interesting with appropriate facts and descriptive details shared while speaking clearly at an understandable pace.

4. Advertisement

Create an advertisement of your choice (television, radio, print, web). Be sure your ad gives enough information about your product to persuade consumers to buy it. Your advertisement should be for a specific target audience (i.e. parents, teachers, kids) and should include what kids will learn by playing with this toy.

Advertisement

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Creativity (x1)	Advertisement is unoriginal in design and does not use graphics.	Advertisement is somewhat original in design and uses graphics to help the reader understand the information.	Advertisement is original in design and uses graphics to help the reader understand the information.	Advertisement is original in design and uses creative graphics to help the reader understand the information.